

IN THE CLAIMS

1-15 Canceled

- 1 16. (currently amended) A downhole injection evaluation system comprising:
- 2 (a) at least one downhole fiber optic sensor permanently disposed a first well
- 3 for sensing at least one parameter associated with injecting a fluid into a
- 4 formation;
- 5 (b) at least one additional downhole fiber optic sensor in a second well.
- 6 the at least one additional sensor operably connected to the at least one
- 7 fiber optic sensor in the first well;
- 8 wherein said first well is ~~selected from~~ one of (I) an injection well, and (II) a
- 9 production well and the second well is the other of (I) an injection well, and (II) a
- 10 production well.
- 11

- 1 17. (currently amended) A downhole injection evaluation system as claimed in claim
- 2 16 wherein said system further includes an electronic controller operably
- 3 connected to said at least one of the downhole fiber optic sensor-sensors.
- 4

1 18. canceled

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1 19. canceled

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1 20. canceled.

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1 21. (currently amended) A downhole injection evaluation system as claimed in
2 ~~claim 17~~ claim 16 wherein said system further includes at least one downhole
3 acoustic signal generator whereby signals generated by said at least one signal
4 generator reflect off a flood fluid/hydrocarbon interface and are received by said
5 at least one of the downhole sensor sensors.

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1 22-59. canceled

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1 60. Canceled

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1 61. (currently amended) The system of claim 17 wherein said electronic controller is at
2 one of (i) a surface location, and (ii) a downhole location..

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1 62. canceled

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1 63. canceled

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1 64. (currently amended) The system of ~~claim 18~~ claim 16 wherein said sensor in said
2 first well is operably connected to said sensor in said second well by a fiber optic
3 link.

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1 65. (currently amended) The system of ~~claim 63~~ claim 16 further comprising a
2 controller ~~for controlling~~ which controls a flow control device in at least one of
3 the first well and the second well.

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1 66. (previously presented) The system of claim 65 wherein said flow control device is
2 selected from the group consisting of: (i) a valve, (ii) fluid control device, (iii)
3 packer, (iv) sliding sleeve, (v) safety valve, (vi) an anchor, and (vii) a pump.

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1 67. (currently amended) The system of ~~claim 63~~ claim 21 further comprising an
2 acoustic receiver in at least one of the first well and the second well.

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1 68. **canceled**

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1 69. (currently amended) The system of claim 67 wherein said acoustic receiver
2 receives acoustic signals indicative of at least one of (i) a location of fluid front
3 between the first well and the second well, and (ii) a fracture between the first
4 well and the second well.

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1 70. **canceled**

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1 71. (currently amended) The system of ~~claim 70~~ claim 69 wherein said signals are

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2 produced by a change in ~~said~~ a fracture in the earth formation.

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1 72. **canceled**

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1 73. **canceled**

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3 74. (currently amended) A method of producing hydrocarbons from a subterranean
4 reservoir comprising:

5 a) permanently installing at least one downhole fiber optic sensor in a first
6 well;

7 (b) operably connecting at least one fiber optic sensor in a second well to the
8 at least one fiber optice sensor in the first well;

9 wherein the first well is one of (I) an injection well, and (II) a production well and
10 the second well is the other of (I) an injection well, and (II) a production well.,

11 ~~for sensing at least one parameter associated with injection of a fluid into~~
12 ~~said reservoir.~~

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1 75. (currently amended) The method of claim 74 further comprising using an
2 electronic controller, operably connected to ~~said~~ at least one of the downhole fiber
3 optic ~~sensor~~ sensors.

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1 76. **canceled**

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- 1 77. (currently amended) The method of claim 74 further comprising
- 2 (i) using at least one downhole acoustic signal generator for generating
- 3 signals that interact with a flood front in said reservoir, and
- 4 (ii) receiving signals resulting from said interaction with ~~said~~ at least one
- 5 of the downhole sensor sensors.

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- 1 78. Canceled

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- 1 79. (currently amended) The method of claim 75 further comprising positioning
- 2 said electronic controller at one of (i) a surface location, and (ii) a downhole
- 3 location.

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- 1 80. canceled

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- 1 81. canceled

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- 1 82. (currently amended) The method of claim 76 further comprising operably
- 2 connecting said at least one sensor in said first well to said at least one sensor in
- 3 said second well by a fiber optic link.

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- 1 83. (currently amended) The method of ~~claim 81~~ claim 74 further comprising using a

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2 controller for controlling a flow control device in at least one of the first well and
3 the second well.

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1 84. (previously presented) The method of claim 83 wherein said flow control device
2 is selected from the group consisting of: (i) a valve, (ii) fluid control device, (iii)
3 packer, (iv) sliding sleeve, (v) safety valve, (vi) an anchor, and (vii) a pump.

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1 85. (currently amended) The method of ~~claim 84~~ claim 74 further comprising using
2 an acoustic receiver in at least one of the first well and the second well for
3 receiving acoustic signals.

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1 86. (currently amended) The method of ~~claim 84~~ claim 74 further comprising using
2 an acoustic transmitter in at least one of the first well and the second well for
3 sending acoustic signals into said reservoir.

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1 87. (currently amended) The method of claim 85 further comprising using said
2 acoustic receiver for receiving acoustic signals indicative of at least one of (i) a
3 location of a fluid front between the first well and the second well, and (ii) a
4 fracture between the first well and the second well.

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1 88. canceled

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- 1 89. (currently amended) The method of ~~claim 88~~ claim 87 wherein said signals are
2 produced by a change in said fracture.
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- 1 90. **canceled**
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- 1 91. **canceled**
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- 1 92. (currently amended) The method of ~~claim 81~~ claim 74 further comprising:
2 (i) using an acoustic transmitter in one of said two wells for propagating
3 acoustic signals into said reservoir, and
4 (ii) using an acoustic receiver in the other of said two wells for receiving said
5 signals after passing through said reservoir.
6
- 1 93. (previously presented) The method of claim 92 further comprising using a
2 controller for processing said signals and determining from said received signals
3 an indication of pressure transmissivity of said reservoir.
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- 1 94. (previously presented) The method of claim 92 further comprising:
2 (A) using a controller for processing said received signals,
3 (B) using a controller for controlling the operation of a fluid control device in
4 at least one of the first well and the second well.
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- 1 95. (new) A downhole injection evaluation system comprising:
- 2 a) at least one downhole fiber optic sensor permanently disposed a first well
- 3 for sensing at least one parameter associated with injecting a fluid into a
- 4 formation; and
- 5 (b) at least one downhole acoustic signal generator whereby signals generated
- 6 by said at least one signal generator interact with at least one of (I) a fluid
- 7 front, and (II) a fracture and are received by said at least one downhole
- 8 sensor.
- 9 wherein said first well is selected from (III) an injection well, and (IV) a
- 10 production well.

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